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Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 09/719,826	Applicant(s) MURASHIMA ET AL.	
	Examiner Huyen Vo	Art Unit 2655	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *12 February 2001*.& 3/27/01

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-16 and 25-32* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-16 and 25-32* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *12 February 2001* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)

2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *5, 8, and 10*.

4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .

5) ☐ Notice of Informal Patent Application (PTO-152)

6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 1-7, 9-15, and 25-31 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ubale et al. (US Patent No. 5778335) in view of Moriya et al. (US Patent No. 6345246).

1. Regarding claim 1, Ubale et al. disclose a speech and music signal coder for producing a reproduction signal by driving a linear prediction synthesis filter in response to an excitation signal which is provided by adding a first excitation signal in correspondence with a first band of an input signal and a second excitation signal in correspondence with a second band of the input signal (col. 8, ln. 10-55 or referring to figure 3), the linear prediction synthesis filter setting with a linear prediction coefficient calculated on the basis of the input signal (element 30 of figure 3), the speech and music signal coder comprising: reproduction signal generating means for reproducing a first reproduction signal by driving the linear prediction synthesis filter in response to the excitation signal in correspondence with the first band (col. 8, ln. 10-55 or referring to figure 3), and an error calculating means for determining the error between the input signal and the reproduction signal (the output of element 36 in figure 1).

Ubale et al. do not disclose a residual signal generating means for generating a residual signal by driving the linear prediction inverse filter in response to a differential signal indicative of a difference between the input signal and the first reproduction signal, and a coding means for

coding means for coding a component in correspondence with the second band in the residual signal after orthogonal transformation of the component. However, Moriya et al. teach a residual signal generating means for generating a residual signal by driving the linear prediction inverse filter in response to a differential signal indicative of a difference between the input signal and the first reproduction signal (the output of the inverse filter 16 in figure 8A) and a coding means for coding a component in correspondence with the second band in the residual signal after orthogonal transformation of the component (col. 11, ln. 56 to col. 12, ln. 9, or referring to elements 12 and 17 of figure 8A). The advantage of using the teaching of Moriya et al. in Ubale et al. is to permit coding with a high prediction gain to ensure efficient coding.

Since Ubale et al. and Moriya et al. are analogous art because they are from the same field of endeavors, it would have been obvious to one of ordinary skill in the art at the time of invention to modify Ubale et al. by incorporating the teaching of Moriya et al. in order to permit coding with a high prediction gain to ensure efficient coding.

2. Regarding claim 2, Ubale et al. disclose a speech and music signal coder for producing a reproduction signal by driving a linear prediction synthesis filter in response to an excitation signal which is provided by adding 3 pieces of excitation signals in correspondence with 3 pieces of bands (figure 3), the speech and music signal coder comprising, the linear prediction synthesis filter setting with a linear prediction coefficient calculated on the basis of the input signal (elements 16 and 30 of figure 3), the speech and music signal coder comprising: reproduction signal generating means for generating a first and a second reproduction signal by driving the linear prediction synthesis filter in response to the excitation signals in correspondence with a first one and a second one of the bands (col. 8, ln. 10-55 or referring to figures 3-5), and an error

calculating means for determining the error between the input signal and the reproduction signal (the output of element 36 in figure 1).

Ubale et al. do not disclose a coding means for generating a residue signal by driving a linear prediction inverse filter in response to a differential signal indicative of a difference between an added signal produced by adding the first and the second reproduction signals and the input signal, and for coding a component in correspondence with a third one of the bands in the residual signal after orthogonal transformation of the component. However, Moriya et al. teach a coding means for generating a residue signal by driving a linear prediction inverse filter in response to a differential signal indicative of a difference between an added signal produced by adding the first and the second reproduction signals and the input signal (the output of the inverse filter 16 in figure 8A), and for coding a component in correspondence with a third one of the bands in the residual signal after orthogonal transformation of the component (col. 11, ln. 56 to col. 12, ln. 9, or referring to elements 12 and 17 of figure 8A). The advantage of using the teaching of Moriya et al. in Ubale et al. is to permit coding with a high prediction gain to ensure efficient coding.

Since Ubale et al. and Moriya et al. are analogous art because they are from the same field of endeavors, it would have been obvious to one of ordinary skill in the art at the time of invention to modify Ubale et al. by incorporating the teaching of Moriya et al. in order to permit coding with a high prediction gain to ensure efficient coding.

3. Regarding claim 3, Ubale et al. disclose a speech and music signal coder for producing a reproduction signal by driving a linear prediction synthesis filter in response to an excitation signal which is provided by adding N pieces of excitation signals in correspondence with N pieces of bands (figure 3), the speech and music signal coder comprising: reproduction signal

generating means for generating a first through an (N-1)-th reproduction signal by driving the linear prediction synthesis filter in response to the excitation signals in correspondence with a first through an (N-1)-th band (col. 8, ln. 10-55 or referring to figures 3-5), and an error calculating means for determining the error between the input signal and the reproduction signal (the output of element 36 in figure 1).

Ubale et al. do not disclose an N-th coding means for generating a residual signal by driving a linear prediction inverse filter in response to a differential signal indicative of difference between a signal produced by adding the first through the (N-1)-th reproduction signals and the input signal, and for coding a component in correspondence with an N-th band in the residual signal after orthogonal transformation of the component. However, Moriya et al. teach an N-th coding means for generating a residual signal by driving a linear prediction inverse filter in response to a differential signal indicative of difference between a signal produced by adding the first through the (N-1)-th reproduction signals and the input signal (the output of the inverse filter 16 in figure 8A), and for coding a component in correspondence with an N-th band in the residual signal after orthogonal transformation of the component (col. 11, ln. 56 to col. 12, ln. 9, or referring to elements 12 and 17 of figure 8A). The advantage of using the teaching of Moriya et al. in Ubale et al. is to permit coding with a high prediction gain to ensure efficient coding.

Since Ubale et al. and Moriya et al. are analogous art because they are from the same field of endeavors, it would have been obvious to one of ordinary skill in the art at the time of invention to modify Ubale et al. by incorporating the teaching of Moriya et al. in order to permit coding with a high prediction gain to ensure efficient coding.

4. Regarding claim 4, Ubale et al. disclose a speech and music signal coder for producing a reproduction signal by driving a linear prediction synthesis filter in response to an excitation signal which is provided by adding 2 pieces of excitation signals in correspondence with 2 pieces of bands (figure 3), the speech and music signal coder comprising: means for calculating a difference of a first coded decoding signal and the input signal (element 36 of figures 3-6).

Ubale et al. do not disclose a coding means for generating a residual signal by driving a linear prediction inverse filter in response to the differential signal, and coding means for coding a component in correspondence with an arbitrary one of the bands in the residual signal after subjecting the component to orthogonal transformation. However, Moriya et al. teach a coding means for generating a residual signal by driving a linear prediction inverse filter in response to the differential signal (the output of the inverse filter 16 in figure 8A), and coding a component in correspondence with an arbitrary one of the bands in the residual signal after subjecting the component to orthogonal transformation (figure 8A). The advantage of using the teaching of Moriya et al. in Ubale et al. is to permit coding with a high prediction gain to ensure efficient coding.

Since Ubale et al. and Moriya et al. are analogous art because they are from the same field of endeavors, it would have been obvious to one of ordinary skill in the art at the time of invention to modify Ubale et al. by incorporating the teaching of Moriya et al. in order to permit coding with a high prediction gain to ensure efficient coding.

5. Regarding claim 5, Ubale et al. disclose a speech and music signal coder for generating a reproduction signal by driving a linear prediction synthesis filter calculated on the basis of an input signal in response to an excitation signal provided by adding 3 pieces of excitation signals in correspondence with 3 pieces of bands (figure 3), the speech and music signal coder

comprising: means for calculating a differential signal indicative of difference between a signal produced by adding a first and a second coded decoding signal and the input signal (the output of element 36 of figure 3).

Ubale et al. do not disclose a coding means for generating a residual signal by driving a linear prediction inverse filter calculated on the basis of the input signal by the differential signal, and for coding a component in correspondence with an arbitrary band in the residual signal after orthogonal transformation of the component. However, Moriya et al. teach a coding means for generating a residual signal by driving a linear prediction inverse filter calculated on the basis of the input signal by the differential signal (the output of the inverse filter 16 in figure 8A) and for coding a component in correspondence with an arbitrary band in the residual signal after orthogonal transformation of the component (figure 8A, the output of the orthogonal transformation block contains a full-band signal). The advantage of using the teaching of Moriya et al. in Ubale et al. is to permit coding with a high prediction gain to ensure efficient coding.

Since Ubale et al. and Moriya et al. are analogous art because they are from the same field of endeavors, it would have been obvious to one of ordinary skill in the art at the time of invention to modify Ubale et al. by incorporating the teaching of Moriya et al. in order to permit coding with a high prediction gain to ensure efficient coding.

6. Regarding claim 6, Ubale et al. disclose a speech and music signal coder for producing a reproduction signal by driving a linear prediction synthesis filter in response to an excitation signal which is provided by adding N pieces of excitation signals in correspondence with N pieces of bands (figure 3), the speech and music signal coder comprising: differential signal calculating means for calculating a differential signal indicative of difference between a signal

produced by adding a first through an (N-1)-th coded decoding signal and the input signal (output of element 36 of figure 3).

Ubale et al. do not disclose an N-th coding means for generating a residual signal by driving an inverse filter of the linear prediction synthesis filter on the basis of the input signal in response the differential signal and for coding a component in correspondence with an arbitrary band in the residual signal after orthogonal transformation of the component. However, Moriya et al. teach an N-th coding means for generating a residual signal by driving an inverse filter of the linear prediction synthesis filter on the basis of the input signal in response the differential signal (the output of the inverse filter 16 in figure 8A) and for coding a component in correspondence with an arbitrary band in the residual signal after orthogonal transformation of the component (figure 8A). The advantage of using the teaching of Moriya et al. in Ubale et al. is to permit coding with a high prediction gain to ensure efficient coding.

Since Ubale et al. and Moriya et al. are analogous art because they are from the same field of endeavors, it would have been obvious to one of ordinary skill in the art at the time of invention to modify Ubale et al. by incorporating the teaching of Moriya et al. in order to permit coding with a high prediction gain to ensure efficient coding.

7. Regarding claim 9, Ubale et al. disclose a speech and music signal decoder for generating a reproduction signal by driving a linear prediction synthesis filter in response to an excitation signal provided by adding an excitation signal in correspondence with a first band and an excitation signal in correspondence with a second band (figures 2-3), the speech and music signal decoder comprises: excitation signal generating means for generating the excitation signal in correspondence with the second band (elements 24-28 of figures 2-3, the reproduced signal includes a second band signal); second reproduction signal generating means for generating a

second reproduction signal by driving the linear prediction synthesis filter in response to the excitation signal (element 30 of figure 2, the reproduced signal includes a second band signal); first reproduction signal generating means for generating a first reproduction signal by driving the linear prediction filter in response to the excitation signal in correspondence with the first band (element 30 of figure 2, the reproduced signal includes a first band signal); and speech and music decoded signal generating means for generating speech and music decoded signal by adding the first reproduction signal and the second reproduction signal (elements 24 and 28 of figure 1, or referring to figures 3-6, excitation signals are added together to create a full-band signal by driving through the synthesis filter 30).

Ubale et al. do not disclose an excitation signal generating means for generating the excitation signal in correspondence with the second band by subjecting a decoding signal and an orthogonal transformation coefficient to orthogonal inverse transformation. However, Moriya et al. teach an excitation signal generating means for generating the excitation signal in correspondence with the second band by subjecting a decoding signal and an orthogonal transformation coefficient to orthogonal inverse transformation (figure 8B). The advantage of using the teaching of Moriya et al. in Ubale et al. is to permit decoding with a high accuracy to ensure decoding efficiency.

Since Ubale et al. and Moriya et al. are analogous art because they are from the same field of endeavors, it would have been obvious to one of ordinary skill in the art at the time of invention to modify Ubale et al. by incorporating the teaching of Moriya et al. in order to permit decoding with a high accuracy to ensure decoding efficiency.

8. Regarding claim 10, Ubale et al. disclose a speech and music signal decoder for generating a reproduction signal by driving a linear prediction synthesis filter in response to an

excitation signal provided by adding 3 pieces of excitation signals in correspondence with a first through a third band (figures 2-3), the speech and music signal decoder comprising: first and second reproduction signal generating means for generating a first and a second reproduction signal by driving the linear prediction filter in response to the excitation signals in correspondence with the first and the second bands (elements 24-28 of figures 2-3, the reproduced signal includes the first and second band signals); third reproduction signal generating means for generating the excitation signal in correspondence with the third band (element 30 of figure 2, the reproduced signal includes a third band signal), and for generating a third reproduction signal by driving the linear prediction synthesis filter in response to the excitation signal (element 30 of figure 2, the reproduced signal includes a third band signal); and speech and music decoded signal generating means for generating a speech and music decoded signal by adding the first through the third reproduction signals (elements 24 and 28 of figure 1, or referring to figures 3-6, excitation signals are added together to create a full-band signal by driving through the synthesis filter 30).

Ubale et al. do not disclose an excitation signal generating means for generating the excitation signal in correspondence with the third band by subjecting a decoding signal and an orthogonal transformation coefficient to orthogonal inverse transformation. However, Moriya et al. teach an excitation signal generating means for generating the excitation signal in correspondence with the second band by subjecting a decoding signal and an orthogonal transformation coefficient to orthogonal inverse transformation (figure 8B). The advantage of using the teaching of Moriya et al. in Ubale et al. is to permit decoding with a high accuracy to ensure decoding efficiency.

Since Ubale et al. and Moriya et al. are analogous art because they are from the same field of endeavors, it would have been obvious to one of ordinary skill in the art at the time of

invention to modify Ubale et al. by incorporating the teaching of Moriya et al. in order to permit decoding with a high accuracy to ensure decoding efficiency.

9. Regarding claim 11, Ubale et al. disclose a speech and music signal decoder for generating a reproduction signal by driving a linear prediction synthesis filter in response to an excitation signal provided by adding N pieces of excitation signals in correspondence with first through an N-th band (figures 2-3), the speech and music signal decoder comprising: first through (N-1)-th reproduction signal generating means for generating a first through an (N-1)-th reproduction signal by driving the linear prediction filter in response to the excitation signals in correspondence with the first through the (N-1)-th bands (elements 24-28 of figures 2-3, the reproduced signal includes the first through (N-1)-th band signals); and speech and music decoded signal generating means for generating a speech and music decoded signal by adding the first through the N-th reproduction signals (elements 24 and 28 of figure 1, or referring to figures 3-6, excitation signals are added together to create a full-band signal by driving through the synthesis filter 30).

Ubale et al. do not disclose N-th reproduction signal generating means for generating an excitation signal in correspondence with the N-th band by subjecting a decoded orthogonal transformation coefficient to orthogonal inverse transformation and for generating an N-th reproduction signal by driving the linear prediction synthesis filter in response to the excitation signal. However, Moriya et al. teach N-th reproduction signal generating means for generating an excitation signal in correspondence with the N-th band by subjecting a decoded orthogonal transformation coefficient to orthogonal inverse transformation and for generating an N-th reproduction signal by driving the linear prediction synthesis filter in response to the excitation

signal (figure 8B). The advantage of using the teaching of Moriya et al. in Ubale et al. is to permit decoding with a high accuracy to ensure decoding efficiency.

Since Ubale et al. and Moriya et al. are analogous art because they are from the same field of endeavors, it would have been obvious to one of ordinary skill in the art at the time of invention to modify Ubale et al. by incorporating the teaching of Moriya et al. in order to permit decoding with a high accuracy to ensure decoding efficiency.

10. Regarding claim 12, Ubale et al. disclose a speech and music signal decoder for generating a reproduction signal for generating a reproduction signal by driving a linear prediction synthesis filter in response to an excitation signal provided by adding excitation signals in correspondence with a first and a second band (figures 2-3), the speech and music signal decoder comprising: reproduction signal generating means for generating a second reproduction signal by driving a linear prediction synthesis filter by the excitation signal (element 30 of figure 2, the reproduced signal includes a second band signal); and speech and music decoded signal generating means for generating a speech and music decoded signal by adding the second reproduction signal and a first reproduction signal from first reproduction signal generating means (elements 24 and 28 of figure 1, or referring to figures 3-6, excitation signals are added together to create a full-band signal by driving through the synthesis filter 30).

Ubale et al. do not disclose a reproduction signal generating means for generating an excitation signal by subjecting a decoded orthogonal transformation coefficient to orthogonal inverse transformation. However, Moriya et al. teach a reproduction signal generating means for generating an excitation signal by subjecting a decoded orthogonal transformation coefficient to orthogonal inverse transformation (figure 8B). The advantage of using the teaching of Moriya et al. in Ubale et al. is to permit decoding with a high accuracy to ensure decoding efficiency.

Since Ubale et al. and Moriya et al. are analogous art because they are from the same field of endeavors, it would have been obvious to one of ordinary skill in the art at the time of invention to modify Ubale et al. by incorporating the teaching of Moriya et al. in order to permit decoding with a high accuracy to ensure decoding efficiency.

11. Regarding claim 13, Ubale et al. disclose a speech and music signal decoder for generating a reproduction signal by driving a linear prediction synthesis filter in response to an excitation signal provided by adding excitation signals in correspondence with a first through a third band (figures 2-3), the speech and music signal decoder comprising: third reproduction signal generating means for generating a third reproduction signal by driving the linear prediction synthesis filter in response to the excitation signal (element 30 of figure 2, the reproduced signal includes a third band signal); and speech and music signal generating means for generating a speech and music signal by adding a first and a second reproduction signal respectively outputted from first and second reproduction signal generating means (elements 24 and 28 of figure 1, or referring to figures 3-6, excitation signals are added together to create a full-band signal by driving through the synthesis filter 30).

Ubale et al. do not disclose a third reproduction signal generating means for generating the excitation signal by subjecting a decoded orthogonal transformation coefficient to orthogonal inverse transformation. However, Moriya et al. teach a third reproduction signal generating means for generating the excitation signal by subjecting a decoded orthogonal transformation coefficient to orthogonal inverse transformation (figure 8B). The advantage of using the teaching of Moriya et al. in Ubale et al. is to permit decoding with a high accuracy to ensure decoding efficiency.

Since Ubale et al. and Moriya et al. are analogous art because they are from the same field of endeavors, it would have been obvious to one of ordinary skill in the art at the time of invention to modify Ubale et al. by incorporating the teaching of Moriya et al. in order to permit decoding with a high accuracy to ensure decoding efficiency.

12. Regarding claim 14, Ubale et al. disclose a speech and music signal decoder for generating a reproduction signal by driving a linear prediction synthesis filter in response to an excitation signal provided by adding N pieces of excitation signals in correspondence with a first through an N-th band (figures 2-3); N-th reproduction signal generating means for generating an N-th reproduction signal by driving the linear prediction synthesis filter in response to the excitation signal (element 30 of figure 2, the reproduced signal includes an N-th band signal); and speech and music decoded signal generating means for generating a speech and music decoded signal by adding the N-th reproduction signal and a first through an (N-1)-th reproduction signal (elements 24 and 28 of figure 1, or referring to figures 3-6, excitation signals are added together to create a full-band signal by driving through the synthesis filter 30).

Ubale et al. do not disclose an N-th reproduction signal generating means for generating the excitation signal by subjecting a decoded orthogonal transformation coefficient to orthogonal inverse transformation. However, Moriya et al. teach an N-th reproduction signal generating means for generating the excitation signal by subjecting a decoded orthogonal transformation coefficient to orthogonal inverse transformation (figure 8B). The advantage of using the teaching of Moriya et al. in Ubale et al. is to permit decoding with a high accuracy to ensure decoding efficiency.

Since Ubale et al. and Moriya et al. are analogous art because they are from the same field of endeavors, it would have been obvious to one of ordinary skill in the art at the time of

invention to modify Ubale et al. by incorporating the teaching of Moriya et al. in order to permit decoding with a high accuracy to ensure decoding efficiency.

13. Regarding claims 7 and 15, Ubale et al. further disclose that a pitch prediction filter is used in generating the excitation signal in correspondence with the first band of the input signal (col. 5, ln. 43-51).

14. Regarding claim 25, Ubale et al. disclose a speech and music signal coding/decoding apparatus comprising: a speech and music signal coder that produces a coded signal by driving a first linear prediction synthesis filter in response to a first excitation signal which is provided by adding a first signal corresponding to a first band of an input signal and a second signal corresponding to a second band of the input signal (figures 2-3), the linear prediction synthesis filter being set with a linear prediction coefficient calculated on the basis of the input signal (referring to elements 16, 30, and 46 of figures 1-2), the speech and music signal coder comprising: a reproduction signal generating circuit producing a reproduction signal by driving the first linear prediction synthesis filter in response to the first signal corresponding to the first band of the input signal (col. 8, ln. 10-55 or referring to figure 3, the reproduction signal contains the first band signal); and a speech and music signal decoder that decodes the coded signal of the signal coder by driving a second linear prediction synthesis filter in response to a second excitation signal provided by adding a first signal corresponding to a first band of the second excitation signal and a second signal corresponding to a second band of the second excitation signal (figures 2-3), the speech and music signal decoder comprising: a second reproduction signal generating circuit generating a second reproduction signal by driving the second linear prediction synthesis filter in response to the second excitation signal (element 30 of figure 2, the

reproduced signal includes an the second band signal); a third reproduction signal generating circuit generating a third reproduction signal by driving the second linear prediction synthesis filter in response to the first signal corresponding to the first band of the second excitation signal (figures 2-3, the output of the synthesis filter contains signals of all bands); and a speech and music decoded signal generating circuit generating a speech and music decoded signal by adding the second reproduction signal and the third reproduction signal (elements 24 and 28 of figure 1, or referring to figures 3-6, excitation signals are added together to create a full-band signal by driving through the synthesis filter 30).

Ubale et al. do not disclose a residual signal generating circuit generating a residual signal by driving a linear prediction inverse filter in response to a differential signal indicative of a difference between the first input signal and the reproduction signal; and a coding circuit coding a component in correspondence with the residual signal after orthogonal transformation of the component; and an excitation signal generating circuit generating the second signal corresponding to the second band of the second excitation signal by subjecting a decoding signal and an orthogonal transformation coefficient to orthogonal inverse transformation. However, Moriya et al. teach a residual signal generating circuit generating a residual signal by driving a linear prediction inverse filter in response to a differential signal indicative of a difference between the first input signal and the reproduction signal (figures 8A-B); and a coding circuit coding a component in correspondence with the residual signal after orthogonal transformation of the component (figure 8A); and an excitation signal generating circuit generating the second signal corresponding to the second band of the second excitation signal by subjecting a decoding signal and an orthogonal transformation coefficient to orthogonal inverse transformation (figure 8B). The advantage of using the teaching of Moriya et al. in Ubale et al. is to permit coding/decoding with a high accuracy to ensure coding/decoding efficiency.

Since Ubale et al. and Moriya et al. are analogous art because they are from the same field of endeavors, it would have been obvious to one of ordinary skill in the art at the time of invention to modify Ubale et al. by incorporating the teaching of Moriya et al. in order to permit coding/decoding with a high accuracy to ensure coding/decoding efficiency.

15. Regarding claim 26, Ubale et al. disclose a speech and music signal coding/decoding apparatus comprising: a speech and music signal coder that produces a coded signal by driving a first linear prediction synthesis filter in response to a first excitation signal which is provided by adding 3 pieces of excitation signals in correspondence with 3 pieces of bands (figure 3), the first linear prediction synthesis filter being set with a linear prediction coefficient calculated on the basis of an input signal (referring to elements 16, 30, and 46 of figures 1-2), the speech and music signal coder comprising: a first reproduction signal generating circuit generating a first and a second reproduction signal by driving the first linear prediction synthesis filter in response to the excitation signals in correspondence with a first one and a second one of the bands (col. 8, ln. 10-55 or referring to figure 3, the reproduction signal contains the first and second band signals); and a speech and music signal decoder that decodes the coded signal of the signal coder by driving a second linear prediction synthesis filter in response to a second excitation signal provided by adding 3 pieces of excitation signals in correspondence with a first through a third band (figures 2-3, different excitation signals representing different bands are added together before exciting the synthesis filter), the speech and music signal decoder comprising: a second reproduction signal generating circuit generating a third and a fourth reproduction signal by driving the second linear prediction filter in response to the second excitation signals in correspondence with the first and the second bands (figures 2-3, the output of the synthesis filter contains signals of all bands); and a speech and music decoded signal generating circuit

generating a speech and music decoded signal by adding the third through the fifth reproduction signals (figures 2-3, the output of the synthesis filter contains signals of all bands), and generating a fifth reproduction signal by driving the second linear prediction synthesis filter in response to the second excitation signal (figures 2-3, the output of the synthesis filter contains signals of all bands).

Ubale et al. do not disclose a coding circuit generating a residual signal by driving a linear prediction inverse filter in response to a differential signal indicative of a difference between an added signal produced by adding the first and the second reproduction signals and the input signal and coding a component in correspondence with a third one of the bands in the residual signal after orthogonal transformation of the component; a third reproduction signal generating circuit generating the second excitation signal in correspondence with the third band by subjecting a decoded orthogonal transformation coefficient to orthogonal inverse transformation, and generating a fifth reproduction signal by driving the second linear prediction synthesis filter in response to the second excitation signal. However, Moriya et al. teach a coding circuit generating a residual signal by driving a linear prediction inverse filter in response to a differential signal indicative of a difference between an added signal produced by adding the first and the second reproduction signals and the input signal (figures 8A-B) and coding a component in correspondence with a third one of the bands in the residual signal after orthogonal transformation of the component (figure 8A); a third reproduction signal generating circuit generating the second excitation signal in correspondence with the third band by subjecting a decoded orthogonal transformation coefficient to orthogonal inverse transformation (figure 8B). The advantage of using the teaching of Moriya et al. in Ubale et al. is to permit coding/decoding with a high accuracy to ensure coding/decoding efficiency.

Since Ubale et al. and Moriya et al. are analogous art because they are from the same field of endeavors, it would have been obvious to one of ordinary skill in the art at the time of invention to modify Ubale et al. by incorporating the teaching of Moriya et al. in order to permit coding/decoding with a high accuracy to ensure coding/decoding efficiency.

16. Regarding claim 27, Ubale et al. disclose a speech and music signal coding/decoding apparatus comprising: a speech and music signal coder that produces a coded signal by driving a first linear prediction synthesis filter in response to a first excitation signal which is provided by adding N pieces of excitation signals in correspondence with N pieces of bands of an input signal (figures 2-3), the speech and music signal coder comprising: a first reproduction signal generating circuit generating a first through an (N-1)-th first reproduction signal by driving the first linear prediction synthesis filter in response to the first excitation signals in correspondence with a first through an (N-1)-th band (col. 8, ln. 10-55 or referring to figure 3, the reproduction signal contains the first through (N-1)-th band signals); and a speech and music signal transformation codes the coded signal of the signal coder by driving a second linear prediction synthesis filter in response to a second excitation signal provided by adding N pieces of excitation signals in correspondence with first through an N-th band (figure 3), the speech and music signal decoder comprising: generating an N-th reproduction signal by driving the second linear prediction synthesis filter in response to the second excitation signal (figures 2-3, the output of the synthesis filter contains all bands); a first through (N-1)□th second reproduction signal generating circuit generating a first through an (N-1)-th second reproduction signal by driving the second linear prediction synthesis filter in response to the second excitation signals in correspondence with the first through the (N-1)-th bands (figures 2-3, the output of the synthesis filter contains the first through (N-1)-th bands); and a speech and music decoded signal

generating circuit generating a speech and music decoded signal by adding the first through the (N-1)-th second reproduction signals (figures 2-3, the output of the synthesis filter contains all the bands).

Ubale et al. do not disclose an N-th coding circuit generating a residual signal by driving a linear prediction inverse filter in response to a differential signal indicative of a difference between a signal produced by adding the first through the (N-1)-th first reproduction signals and the input signal and coding a component in correspondence with an N-th band in the residual signal after orthogonal transformation of the component (figure 8A) and an N-th reproduction signal generating circuit generating a reproduction signal in correspondence with the N-th band by subjecting a decoded orthogonal transformation coefficient to orthogonal inverse transformation (figure 8B). The advantage of using the teaching of Moriya et al. in Ubale et al. is to permit coding/decoding with a high accuracy to ensure coding/decoding efficiency.

Since Ubale et al. and Moriya et al. are analogous art because they are from the same field of endeavors, it would have been obvious to one of ordinary skill in the art at the time of invention to modify Ubale et al. by incorporating the teaching of Moriya et al. in order to permit coding/decoding with a high accuracy to ensure coding/decoding efficiency.

17. Regarding claim 28, Ubale et al. disclose a speech and music signal coding/decoding apparatus comprising: a speech and music signal coder that produces a coded signal by driving a first linear prediction synthesis filter in response to a first excitation signal which is provided by adding 2 pieces of excitation signals in correspondence with 2 pieces of bands (figures 3-6), the speech and music signal coder comprising: a difference circuit calculating a difference of a first coded decoding signal and an input signal (the output of element 36); and a speech and music signal decoder that decodes the coded signal of the signal coder by driving a second linear

prediction synthesis filter in response to a second excitation signal provided by adding excitation signals in correspondence with a first and a second band (figures 2-3, excitation signals are added together before exciting the synthesis filter), the speech and music signal decoder comprising: generating a second reproduction signal by driving a third linear prediction synthesis filter by the first reproduction signal (figures 2-3, the output of the synthesis filter contains all band signal); and a speech and music decoded signal generating circuit generating a speech and music decoded signal by adding the second reproduction signal and the first reproduction signal from reproduction signal generating circuit (figures 2-3, excitations signals are added together before driving the synthesis filter to generate a reproduction signal having the first and second bands).

Ubale et al. do not disclose a coding circuit generating a residual signal by driving a linear prediction inverse filter in response to the differential signal and coding a component in correspondence with an arbitrary one of the bands in the residual signal after subjecting the component to orthogonal transformation; a reproduction signal generating circuit generating a first reproduction signal by subjecting a decoded orthogonal transformation coefficient to orthogonal inverse transformation. However, Moriya et al. teach a coding circuit generating a residual signal by driving a linear prediction inverse filter in response to the differential signal and coding a component in correspondence with an arbitrary one of the bands in the residual signal after subjecting the component to orthogonal transformation (figure 8A); a reproduction signal generating circuit generating a first reproduction signal by subjecting a decoded orthogonal transformation coefficient to orthogonal inverse transformation (figure 8B). The advantage of using the teaching of Moriya et al. in Ubale et al. is to permit coding/decoding with a high accuracy to ensure coding/decoding efficiency.

Since Ubale et al. and Moriya et al. are analogous art because they are from the same field of endeavors, it would have been obvious to one of ordinary skill in the art at the time of invention to modify Ubale et al. by incorporating the teaching of Moriya et al. in order to permit coding/decoding with a high accuracy to ensure coding/decoding efficiency.

18. Regarding claim 29, Ubale et al. disclose a speech and music signal coding/decoding apparatus comprising: a speech and music signal coder that produces a coded signal by driving a first linear prediction synthesis filter in response to an excitation signal provided by adding 3 pieces of excitation signals in correspondence with 3 pieces of bands of an input signal (figures 1-3), the speech and music signal coder comprising: a difference circuit calculating a differential signal indicative of difference between a signal produced by adding a first and a second coded decoding signal and the input signal (the output of element 36 in figure 1); and a speech and music signal decoder that decodes the coded signal of the signal coder by driving a second linear prediction synthesis filter in response to a second excitation provided by adding excitation signals in correspondence with a first through a third band (figures 2-3), the speech and music signal decoder comprising: and a speech and music signal generating circuit generating a speech and music signal by adding the first and a second reproduction signals generated by the first and second reproduction signal generating circuit (figures 2-3, excitations signals are added together before driving the synthesis filter to generate a reproduction signal having the first and second bands).

Ubale et al. do not disclose a coding circuit generating a residual signal by driving a linear prediction inverse filter calculated on the basis of the input signal and the differential signal, and coding a component in correspondence with an arbitrary band in the residual signal after orthogonal transformation of the component (figure 8A); a first reproduction signal

generating circuit generating a first reproduction signal by subjecting a decoded orthogonal transformation coefficient to orthogonal inverse transformation; a second reproduction signal generating circuit generating a second reproduction signal by driving the second linear prediction synthesis filter in response to the first reproduction signal (figure 8B). However, Moriya et al. teach a coding circuit generating a residual signal by driving a linear prediction inverse filter calculated on the basis of the input signal and the differential signal, and coding a component in correspondence with an arbitrary band in the residual signal after orthogonal transformation of the component (figure 8A); a first reproduction signal generating circuit generating a first reproduction signal by subjecting a decoded orthogonal transformation coefficient to orthogonal inverse transformation; a second reproduction signal generating circuit generating a second reproduction signal by driving the second linear prediction synthesis filter in response to the first reproduction signal (figure 8B). The advantage of using the teaching of Moriya et al. in Ubale et al. is to permit coding/decoding with a high accuracy to ensure coding/decoding efficiency.

Since Ubale et al. and Moriya et al. are analogous art because they are from the same field of endeavors, it would have been obvious to one of ordinary skill in the art at the time of invention to modify Ubale et al. by incorporating the teaching of Moriya et al. in order to permit coding/decoding with a high accuracy to ensure coding/decoding efficiency.

19. Regarding claim 30, Ubale et al. disclose a speech and music signal coding/decoding apparatus comprising: a speech and music signal coder that produces a coded signal by driving a first linear prediction synthesis filter in response to a first excitation signal which is provided by adding N pieces of excitation signals in correspondence with N pieces of bands of an input signal (figures 1-3), the speech and music signal coder comprising: a differential signal calculating circuit calculating a differential signal indicative of difference between a signal produced by

adding a first through an (N-1)-th coded decoding signal and the input signal (the output of element 36 of figure 1); and a speech and music signal decoder that decodes the coded signal of the signal coder by driving a second linear prediction synthesis filter in response to a second excitation signal provided by adding N pieces of excitation signals in correspondence with a first through an N-th band (figures 2-3); and a speech and music decoded signal generating circuit generating a speech and music decoded signal by adding the N-th reproduction signal and a first through an (N-1)-th reproduction signal (figures 2-3, the excitation signals are added together before driving the synthesis filter to generate a reproduction signal).

Ubale et al. do not disclose an N-th coding circuit generating a residual signal by driving an inverse filter of the first linear prediction synthesis filter on the basis of the input signal in response the differential signal and coding a component in correspondence with an arbitrary band in the residual signal after orthogonal transformation of the component; the speech and music signal decoder comprising: an N-th reproduction signal generating circuit generating a first reproduction signal by subjecting a decoded orthogonal transformation coefficient to orthogonal inverse transformation and generating an N-th reproduction signal by driving the second linear prediction synthesis filter in response to the first reproduction signal. However, Moriya et al. teach an N-th coding circuit generating a residual signal by driving an inverse filter of the first linear prediction synthesis filter on the basis of the input signal in response the differential signal and coding a component in correspondence with an arbitrary band in the residual signal after orthogonal transformation of the component (figure 8A); the speech and music signal decoder comprising: an N-th reproduction signal generating circuit generating a first reproduction signal by subjecting a decoded orthogonal transformation coefficient to orthogonal inverse transformation and generating an N-th reproduction signal by driving the second linear prediction synthesis filter in response to the first reproduction signal (figure 8B).

The advantage of using the teaching of Moriya et al. in Ubale et al. is to permit coding/decoding with a high accuracy to ensure coding/decoding efficiency.

Since Ubale et al. and Moriya et al. are analogous art because they are from the same field of endeavors, it would have been obvious to one of ordinary skill in the art at the time of invention to modify Ubale et al. by incorporating the teaching of Moriya et al. in order to permit coding/decoding with a high accuracy to ensure coding/decoding efficiency.

20. Regarding claim 31, Ubale et al. further disclose a speech and music signal coding/decoding apparatus, wherein: the speech and music signal coder further comprises a first pitch prediction filter that generates the first signal corresponding to the first band of the input signal (col. 5, ln. 43-51); and the speech and music signal decoder further comprises a second pitch prediction filter that generates the first signal corresponding to the first band of the second excitation signal (figures 2-3 and col. 5, ln. 43-51).

Claims 8, 16, and 32 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ubale et al. (US Patent No. 5778335) in view of Moriya et al. (US Patent No. 6345246), and further in view of Matsumoto et al. (US Patent No. 5819212).

21. Regarding claim 8, Ubale et al. disclose a speech and music signal coder comprising: first reproduction signal generating means for generating a first reproduction signal by driving a synthesis filter set with a first linear prediction coefficient calculated on the basis of the second input signal in response to an excitation signal (figure 1, the input to the first reproduction signal is a signal that is already down-sampled as taught by Matsumoto et al. discussed below); residual signal generating means for calculating a fourth linear prediction coefficient on the basis of a

sum of the second linear prediction coefficient and the third linear prediction coefficient and for generating a residual signal by driving an inverse filter set with the fourth linear prediction coefficient on the basis of a differential signal indicative of difference between the first input signal and the second reproduction signal (the output of element 36 in figure 1).

Ubale et al. do not disclose a second input signal generating means for generating a second input signal by downsampling a first input signal sampled at a first sampling frequency to a second sampling frequency; second reproduction signal generating means for generating a second reproduction signal by up-sampling the first reproduction signal to the first sampling frequency; third linear prediction coefficient calculating means for calculating a third linear prediction coefficient on the basis of a difference of the first linear prediction coefficient and a second linear prediction coefficient provided by converting a sampling frequency to the first sampling frequency; and coding means for coding a component in correspondence with an arbitrary band in the residual signal after orthogonal transformation of the component.

However, Moriya et al. teach coding means for coding a component in correspondence with an arbitrary band in the residual signal after orthogonal transformation of the component (figure 8A, the output of the orthogonal transformation unit contains a full-band signal). The advantage of using the teaching of Moriya et al. in Ubale et al. is to permit coding with a high accuracy to ensure coding efficiency.

Since Ubale et al. and Moriya et al. are analogous art because they are from the same field of endeavors, it would have been obvious to one of ordinary skill in the art at the time of invention to modify Ubale et al. by incorporating the teaching of Moriya et al. in order to permit coding with a high accuracy to ensure coding efficiency.

The modified Ubale et al. still fail to disclose a second input signal generating means for generating a second input signal by downsampling a first input signal sampled at a first sampling

frequency to a second sampling frequency; second reproduction signal generating means for generating a second reproduction signal by up-sampling the first reproduction signal to the first sampling frequency; third linear prediction coefficient calculating means for calculating a third linear prediction coefficient on the basis of a difference of the first linear prediction coefficient and a second linear prediction coefficient provided by converting a sampling frequency to the first sampling frequency.

However, Matsumoto et al. teach a second input signal generating means for generating a second input signal by downsampling a first input signal sampled at a first sampling frequency to a second sampling frequency (the output of the downsampler 203 in figure 1); second reproduction signal generating means for generating a second reproduction signal by up-sampling the first reproduction signal to the first sampling frequency (element 322 of figure 2, the synthesized signal is up-sampled at a higher frequency); third linear prediction coefficient calculating means for calculating a third linear prediction coefficient on the basis of a difference of the first linear prediction coefficient and a second linear prediction coefficient provided by converting a sampling frequency to the first sampling frequency (figure 2). The advantage of using the teaching of Matsumoto et al. in the modified Ubale et al. is to permit coding with a high accuracy to ensure coding efficiency.

Since the modified Ubale et al. and Matsumoto et al. are analogous art because they are from the same field of endeavors, it would have been obvious to one of ordinary skill in the art at the time of invention to further modify Ubale et al. by incorporating the teaching of Matsumoto et al. in order to permit coding with a high accuracy to ensure coding efficiency.

22. Regarding claim 16, Ubale et al. disclose a speech and music signal decoder comprising: generating a second reproduction signal by driving a second linear prediction synthesis filter in

response to the second excitation signal (the output of the synthesis filter in figure 1 contain a signal excited by the second excitation signal); and speech and music decoded signal generating means for generating a speech and music decoded signal by adding the first and the second reproduction signal (figure 3, excitation signals are added together before driving the synthesis filter).

Ubale et al. do not disclose second reproduction signal generating means for generating a second excitation signal in correspondence with a second band by subjecting a decoded orthogonal transformation coefficient to orthogonal inverse transformation. However, Moriya et al. teach second reproduction signal generating means for generating a second excitation signal in correspondence with a second band by subjecting a decoded orthogonal transformation coefficient to orthogonal inverse transformation (figure 2B). The advantage of using the teaching of Moriya et al. in Ubale et al. is to permit decoding with a high accuracy to ensure decoding efficiency.

Since Ubale et al. and Moriya et al. are analogous art because they are from the same field of endeavors, it would have been obvious to one of ordinary skill in the art at the time of invention to modify Ubale et al. by incorporating the teaching of Moriya et al. in order to permit decoding with a high accuracy to ensure decoding efficiency.

The modified Ubale et al. still fail to disclose a first reproduction signal generating means for up-sampling a signal provided by driving a first linear prediction synthesis filter in response to a first excitation signal in correspondence with a first band to a first sampling frequency and for generating a reproduction signal. However, Matsumoto et al. teach first reproduction signal generating means for up-sampling a signal provided by driving a first linear prediction synthesis filter in response to a first excitation signal in correspondence with a first band to a first sampling frequency and for generating a reproduction signal (figure 1, the input to the first reproduction

signal is a signal that is already down-sampled). The advantage of using the teaching of Matsumoto et al. in the modified Ubale et al. is to permit decoding with a high accuracy to ensure decoding efficiency.

Since the modified Ubale et al. and Matsumoto et al. are analogous art because they are from the same field of endeavors, it would have been obvious to one of ordinary skill in the art at the time of invention to further modify Ubale et al. by incorporating the teaching of Matsumoto et al. in order to permit decoding with a high accuracy to ensure decoding efficiency.

23. Regarding claim 32, Ubale et al. disclose a speech and music signal coding/decoding apparatus comprising: a speech and music signal coder comprising: a first reproduction signal generating circuit generating a first reproduction signal by driving a synthesis filter set with a first linear prediction coefficient calculated on the basis of the input signal in response to a first excitation signal (figure 1, the input to the first reproduction signal is a signal that is already down-sampled as taught by Matsumoto et al. discussed below); a residual signal generating circuit calculating a fourth linear prediction coefficient on the basis of a sum of the third linear prediction coefficient and the first linear prediction coefficient and generating a residual signal by driving an inverse filter set with a fourth linear prediction coefficient calculated on the basis of a differential signal indicative of difference between the sampling signal and the second reproduction signal (the output of element 36 in figure 1); and a speech and music signal decoder comprising: a speech and music decoded signal generating circuit generating a speech and music decoded signal by adding the third and the fourth reproduction signal (figures 2-3, the output of the synthesis filter is a full-band signal containing all bands).

Ubale et al. do not disclose a coding circuit coding a component in correspondence with an arbitrary band in the residual signal after orthogonal transformation of the component; and a

speech and music signal decoder comprising: a third reproduction signal generating circuit up-sampling a signal provided by driving a second linear prediction synthesis filter in response to a second excitation signal in correspondence with a first band to a third sampling frequency and generating a third reproduction signal; a fourth reproduction signal generating circuit generating a second excitation signal in correspondence with a second band by subjecting a decoded orthogonal transformation coefficient to orthogonal inverse transformation and generating a fourth reproduction signal by driving a third linear prediction synthesis filter in response to the second excitation signal; an input signal generating circuit generating an input signal by downsampling a sampling signal sampled at a first sampling frequency to a second sampling frequency; a second reproduction signal generating circuit generating a second reproduction signal by up-sampling the first reproduction signal to the first sampling frequency; a linear prediction coefficient calculating circuit calculating a first linear prediction coefficient on the basis of a difference between a second linear prediction coefficient and a third linear prediction coefficient provided by converting a sampling frequency to the first sampling frequency.

However, Moriya et al. teach a coding circuit coding a component in correspondence with an arbitrary band in the residual signal after orthogonal transformation of the component (figure 8A, the output of the orthogonal transform unit contain all bands ready for selection); a speech and music signal decoder comprising: fourth reproduction signal generating circuit generating a second excitation signal in correspondence with a second band by subjecting a decoded orthogonal transformation coefficient to orthogonal inverse transformation and generating a fourth reproduction signal by driving a third linear prediction synthesis filter in response to the second excitation signal (figures 8B). The advantage of using the teaching of Moriya et al. in Ubale et al. is to permit coding/decoding with a high accuracy to ensure coding/decoding efficiency.

Since Ubale et al. and Moriya et al. are analogous art because they are from the same field of endeavors, it would have been obvious to one of ordinary skill in the art at the time of invention to modify Ubale et al. by incorporating the teaching of Moriya et al. in order to permit coding/decoding with a high accuracy to ensure coding/decoding efficiency.

The modified Ubale et al. still fail to disclose a speech and music signal decoder comprising: a third reproduction signal generating circuit up-sampling a signal provided by driving a second linear prediction synthesis filter in response to a second excitation signal in correspondence with a first band to a third sampling frequency and generating a third reproduction signal; and an input signal generating circuit generating an input signal by downsampling a sampling signal sampled at a first sampling frequency to a second sampling frequency; a second reproduction signal generating circuit generating a second reproduction signal by up-sampling the first reproduction signal to the first sampling frequency; a linear prediction coefficient calculating circuit calculating a first linear prediction coefficient on the basis of a difference between a second linear prediction coefficient and a third linear prediction coefficient provided by converting a sampling frequency to the first sampling frequency.

However, Matsumoto et al. teach a speech and music signal decoder comprising: a third reproduction signal generating circuit up-sampling a signal provided by driving a second linear prediction synthesis filter in response to a second excitation signal in correspondence with a first band to a third sampling frequency and generating a third reproduction signal (figure 2, the signal is up-sampled to the original rate before playback); and an input signal generating circuit generating an input signal by downsampling a sampling signal sampled at a first sampling frequency to a second sampling frequency (the output of the downsampler 203 in figure 1); a second reproduction signal generating circuit generating a second reproduction signal by up-sampling the first reproduction signal to the first sampling frequency (element 322 of figure 2,

the synthesized signal is up-sampled at a higher frequency); a linear prediction coefficient calculating circuit calculating a first linear prediction coefficient on the basis of a difference between a second linear prediction coefficient and a third linear prediction coefficient provided by converting a sampling frequency to the first sampling frequency (figure 2). The advantage of using the teaching of Matsumoto et al. in the modified Ubale et al. is to permit coding/decoding with a high accuracy to ensure coding/decoding efficiency.

Since the modified Ubale et al. and Matsumoto et al. are analogous art because they are from the same field of endeavors, it would have been obvious to one of ordinary skill in the art at the time of invention to further modify Ubale et al. by incorporating the teaching of Matsumoto et al. in order to permit coding/decoding with a high accuracy to ensure coding/decoding efficiency.

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Mermelstein (US Patent No. 5526464) teaches a method for reducing search complexity for CELP coding that is considered pertinent to the claimed invention.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Huyen Vo whose telephone number is 703-305-8665. The examiner can normally be reached on M-F, 9-5:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Doris To can be reached on 703-305-4827. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

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Examiner Huyen X. Vo

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April 29, 2004

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